

## Counting: Fundamental Rule and Factorial Rule

Name \_\_\_\_\_

- 1.) If an airline has 15 flights from San Francisco to Chicago and 20 flights from Chicago to New York, how many flights are there from San Francisco to New York Passing through Chicago?
- 2.) I wish to choose one of five books to read and one of three snacks to eat while I read. What are the total number of book/snack combinations?
- 3.) A new SUV is available in nine different exterior colors and three different interior colors. How many distinct color combinations are available?
- 4.) How many distinct, five digit zip codes are possible?
- 5.) You have 7 bracelets to wear on your wrist. Each bracelet matches a color in the rainbow (ROY G BIV). How many different ways can the bracelets be arranged? What is the probability that they are arranged in the order of the rainbow?
- 6.) After school you have five errands to run: get books from your locker, ask Mr. Litecky about an assignment, drop a check off at the business office, text your best friend, and walk down third hall to see if you can get a glimpse of that special someone you have had your eye on... How many different routes are possible to complete your tasks?
- 7.) How many ways can a president, vice president, secretary, and treasurer be chosen from a club with 8 seniors, 10 juniors, 15 sophomores, and 20 freshman if:
  - a) There are no restrictions?
  - b) The president must be a senior?
  - c) The vice president cannot be a senior?
  - d) Freshmen are only eligible to be secretary?
- 8.) How many different sets of answers are possible on a test with 30 true-false questions?
- 9.) What is the probability that you guess on each question and get 100 % correct?

10.) The call letters for radio stations in the United States consist of either three or four letters beginning with either k or w. How many different call letters are possible?

11.) How many license plates are there consisting of two letters followed by four digits?

12.) How many license plates are there consisting of two letters followed by four digits if the digits cannot be repeated, but the letters can?

13.) How many license plates are there consisting of two letters followed by four digits if none of the letters can be a vowel? If one or more of the letters must be a vowel?

14.) If an area code cannot begin with a 0, 1, or 8, how many telephone numbers are possible?

15.) If a computer password must contain seven symbols consisting of either letters or single-digit integers, how many passwords are there which begin with a letter?

16.) What is the probability that a hacker would be able to guess your password?

17.) How many distinct four-digit nonnegative numbers are there with possible leading zeros?

18.) How many distinct four-digit nonnegative numbers are there with possible leading zeros when a digit cannot be repeated?

19.) How many distinct four-digit nonnegative numbers are there with possible leading zeros if at least two of the digits must be the same?